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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,780	08/30/2001	Takeo Tsukamoto	35.C15727	7587

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EXAMINER

VU, DAVID HUNG

ART UNIT PAPER NUMBER

2821

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/941,780

Applicant(s)

TSUKAMOTO, TAKEO

Examiner

David Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 and 18-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13 is/are allowed.
- 6) ☒ Claim(s) 14-21, 23-27, 29-34 and 36-45 is/are rejected.
- 7) ☒ Claim(s) 22, 28 and 35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7, 11.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### **Part III DETAILED ACTION**

#### ***Specification***

1. Applicant's cooperation is requested in correcting any other errors of which applicant may become aware in the specification, drawings, and claims.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or  
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 14-15,18-21,23-27,30-34,36-45 are rejected under 35 U.S.C. 102(e) as

being anticipated by Kitamura et al. U.S. Pub. No: 2002/0031972.

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Kitamura et al. disclose the claimed invention including fibers containing carbon as a main ingredient comprises graphene (carbon nanotube/cylindrical graphenes) on first electrode 3; second electrode 2; substrate 1; gap d; light emitting device (phosphor) 62; first voltage application means Vf for applying to electrode 2 a potential higher than that to the first electrode 3; third electrode (anode) 61 inherently on a substrate; second voltage application means Va having potential higher than that of both the first and second electrodes; a surface region of the fibers is placed on a plane parallel to surface of substrate 1; the fibers comprises a plurality of graphenes stacked so as to be nonparallel to the axis direction of the fiber; at least one more effective material in the form of particles, i.e., Ni, Pd, Fe, Co in accelerating deposition of carbon; a plurality of electrodes in matrix form in an image display, plurality of electron-emitting devices, light emitting member (phosphor) 62 emitting light when irradiated with electrons from the cathode electrode; see, for example, the figures 2A-2B, 6; 8-11; pages 3-7.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura et al.

Kitamura et al. essentially disclose the claimed invention but fail to disclose the thickness of the first electrode is larger than that of the second electrode. However, selecting the thickness of the first electrode larger than that of the second electrode would have been considered obvious since a change in size is generally recognized as being within the level of ordinary skill in the art.

6. Claims 14-15,18-20,40-41,44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lambe U.S. Pat. No. 4,728,851 in view of the American Chemical Society published paper by Rodriguez et al.

Lambe et al. essentially disclose the claimed invention including fiber carbon on cathode electrode 16 and gate electrode 14 on substrate 12; gap 20; light emitting member 26 (phosphor) and anode electrode 24 on substrate 22; see, for example, the figure; column 2. Lambe et al. does not explicitly fibers containing carbon as main ingredient has a plurality of graphenes layered stacked so as not to be parallel to an axis direction of the fiber. Rodriguez et al. disclose fibers containing carbon as main ingredient has a plurality

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of graphenes layered so as not to be parallel to an axis direction of the fiber (figures 1-2; pages 3863-3864). Thus, it would have been obvious to one having ordinary skill in the art at the time of applicant's claimed invention was made to have provided the Lambe et al. reference with the fibers as taught by Rodriguez et al. so as to effect the emission of electrons.

Regarding claim 15, figures 1-2 do show the graphenes are substantially parallel to each other.

Regarding claims 20, column 2 does disclose plurality of electron-emitting devices and how light emitting member 26 emits light when irradiated with electrons from the cathode electrode.

7. Claims 21,23,25-27,29-34,36-39,42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lambe U.S. Pat. No. 4,728,851 in view of Deguchi et al U.S. Pat. No. 6,400,091.

Lambe et al. essentially disclose the claimed invention including carbon fiber first electrode 16 and second electrode 14 on substrate 12; gap 20; light emitting device (phosphor) 26; first voltage application means 30 for applying to electrode 14 a potential higher than that to the first electrode 16; third electrode 24; second voltage application

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means 34 having potential higher than that of both the first and second electrodes; see, for example, the figure; column 2. Lambe et al. does not explicitly fibers containing carbon as main constituent on first electrode and parallel to a surface containing the third electrode 24. Deguchi et al. disclose fibers containing carbon as main constituent (graphene) on cathode 12 and parallel to anode 13 (figure 1A; columns 5-7). An obvious modification would have provided the Lambe et al. reference with the fibers as taught by Deguchi et al. It would have been obvious to one having ordinary skill in the art at the time of applicant's claimed invention was made to have provided the Lambe et al. reference with the fibers disposed on the first electrode as it would have produced a large quantity of electrons.

Regarding claim 23, 36, column 6 does disclose the fibers comprise carbon nanotube/cylindrical graphene.

Regarding claims 25-27, column 6, lines 44+, does disclose at least one more effective material in the form of particles, e.g., Ni, in accelerating deposition of carbon.

Regarding claim 29, selecting the thickness of the first electrode larger than that of the second electrode would have been considered obvious since a change in size is generally recognized as being within the level of ordinary skill in the art.

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Regarding claims 30-31, 33, 38-39, column 2 does disclose a plurality of electrodes in matrix form in an image display, plurality of electron-emitting devices, and how light emitting member 26 emits light when irradiated with electrons from the cathode electrode.

Regarding claims 42-43, the figure does show phosphor 26 and anode 24 on substrate 22.

8. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lambe and Deguchi et al in view of Rodriguez et al.

Lambe as discussed from the above, essentially disclose the claimed invention but fail to disclose fibers containing carbon as main ingredient has a plurality of graphenes layered stacked so as not to be parallel to an axis direction of the fiber. Rodriguez et al. disclose fibers containing carbon as main ingredient has a plurality of graphenes layered so as not to be parallel to an axis direction of the fiber (figures 1-2; pages 3863-3864). Thus, it would have been obvious to one having ordinary skill in the art at the time of applicant's claimed invention was made to have provided the Lambe and Deguchi et al combination with the fibers as taught by Rodriguez et al. so as to effect the emission of electrons.

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***Allowable Subject Matter***

9. Claims 22,28,35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Claims 1-13 are allowed.

***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (703) 305-6077.

12. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

13. Papers related to Technology Center 2800 applications **only** may be submitted to Technology Center 2800 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Technology Center Fax Center number is (703) 308-7722 or (703) 308-7724.

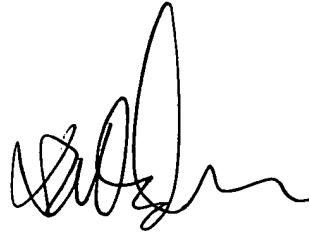
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dv

April 20, 2003

A handwritten signature in black ink, appearing to read 'David Vu', with a stylized, cursive script.

**DAVID VU  
PRIMARY EXAMINER**